



Governor's Office of Economic Development

Grant Recipients for the 2010-11 (R2) TCIP Solicitation

Total proposals reviewed: 42

Total recommended for funding: 22

Licensees: 14

Affiliates: 5

UU Internal teams: 2

USU internal teams: 1

The technologies are emerging from the following universities:

12 of 22 from UU

5 of 7 from BYU

3 of 9 from USU

1 of 2 from SLCC

1 of 1 from UVU

0 of 1 from WSU

FUNDED

Aciont

CEO/Principal: John Higuchi

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: LS

The project is a preclinical proof of concept research plan as a premise to create the ultimate achievement in ophthalmic therapy: to treat non-invasively, age related macular degeneration (AMD) and diabetic retinopathy. The project intends to develop a safe and an effective, an approximate 20 minute iontophoresis treatment for the delivery of macromolecules such as Avastin® to the posterior section of the eye, which can be administered by a nurse or paraprofessional or potentially, patients themselves. This Visulex® system is a combination novel ocular iontophoresis device - an eye applicator resembling a scleral lens - and enhancement formulation capable of delivering large, antibody agents to the posterior segment of the eye. Iontophoresis is a method of delivering drugs through body tissue using the aid of a mild electrical current. Visulex offers a customized, localized controlled release therapy designed to minimize unnecessary patient exposure to the drug.

Akadi Technologies

CEO/Principal: Wes Christiansen

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT



Akadi digital signage is unique in that it creates a network of displays, organized by time, geographic location and demographic audience which can be managed by any user from any web enabled device. Value in the network increases as the reach of the network grows, enabling advertisers and diverse interest groups to target unique audiences with specific and relevant information. For advertisers to be successful today they have to stand out! Success in business today is less about advertising and more about connecting through social media, viral messaging and other meaningful interactions. Targeted messaging and information that is personalized and relevant is the only way to reach through the clutter of messages we are bombarded with on a daily basis. Akadi Technologies is perfectly positioned to be able to leverage a number of technologies, existing and currently under development, to redefine digital signage and targeted and interactive messaging.

AnalySwift

CEO/Principal: Allan Wood

Univ.: USU

Affiliate/Licensee/Univ.: Licensee

Cluster: MMEE/IT

VABS is a unique technology capable of rigorously modeling 3D slender solids with complex microstructures, such as wind turbine blades, helicopter rotor blades, bridges, and other beam-shaped structures. VABS has been consistently demonstrated to be much better than other technologies regarding accuracy, efficiency, and versatility. This technology can save several orders of magnitude in computing time with little loss of accuracy and is gaining an international reputation in rotorcraft and wind power industries. Major companies such as Boeing, Siemens, AeroVironment have licensed VABS. All the other competitive technologies have a very limited set of capabilities and few of them can treat composites which are extensively used now. Furthermore, none of the existing tools have a strong endorsement from the research-oriented community as VABS has. We strongly believe that VABS will become a very competitive product and the tool of choice for modeling composite beam structures.

Credibility Assessment Technologies

CEO/Principal: Donald R. Sanborn

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT

Ocular-motor Deception Test (ODT) is the first major breakthrough in deception detection technology in 20 years, with numerous security screening and intelligence applications. This revolutionary technology provides a powerful new methodology for detecting deception. The ODT measures cognitive consequences of deception with a highly sensitive eye tracking system that records eye movements and pupil diameter changes as the subject reads true/false questions presented by a computer. The ODT compared with other technologies like the polygraph, it is more competitive: It is easily-administered, takes only 25 minutes, is cost effective, achieves the same accuracy (85%), can be administered in multiple languages and settings, facilitates high volume testing, and is customizable to different needs. In conclusion, the ODT reduces the need for time-consuming and expensive polygraph examinations and brings simplicity, speed, and convenience to screening process.

DBS Electrode Array

CEO/Principal: Alan Dale Dorval II

Univ.: UU

Affiliate/Licensee/Univ.: UU

Cluster: IT/LS

Massive-Multielectrode, Cross-Hatched Planar Arrays for Deep Brain Stimulation. This device will allow the user to control the direction and shape of the electric field.

The proposed device will allow for complete control over the electric field including its shape and direction. No longer will the field center be limited to the electrode contact, and no longer will it be limited to a spherical shape. By using a unique cross shaped electrode with approximately 10,000 contacts, this device will be able to shape the field to fit the particular region of the brain that requires stimulation, without crossing over into undesired regions. DBS treatment with this device will be more effective and safe, and more flexible, as different regions of the brain would not require specially shaped electrodes.

Distal Access

CEO/Principal: Shawn P. Fojtik

Univ.: UU

Affiliate/Licensee/Univ.: Affiliate

Cluster: LS/MMEE

Doctors spin needles, catheters, and wires to access deep inside organs or clear catheters and vessels. Spinning by hand gives surgeons feel & control but lack power & speed. Electrical powered 'drill-like' devices give power & speed, but are bulky, expensive, and lack feel & control. Clinicians need a device that combines power & speed with feel & control. The SPINR is a hand-held, mechanical, cost-effective device that spins needles, catheters, and wires when the doctor squeezes their hand. SPINR's simple 6-piece molded design includes a helical gear that converts the squeeze of the handles into axial rotation. Gearing can be adjusted for high-rotation or high-torque applications. Connecting guidewires to the SPINR helps wires vibrate and advance through narrowings or blockages. Oscillating shaped wires and catheter with the SPINR creates a powerful device to macerate blockages in catheters and vessels. SPINR: the speed of a motor with the feel of the hand.

Domain Surgical

CEO/Principal: David J. McNally

Univ.: UU

Affiliate/Licensee/Univ.: Affiliate

Cluster: LS

Surgery often requires the cutting and coagulation of vascularized tissues and blood vessels, including the sealing of individual large arteries, veins, and lymphatics. A large market has evolved based upon the promise of improved outcomes related to the sealing and cutting of blood vessels. Innovations intended to improve the speed and integrity of sealing vessels have been introduced in recent years, but many surgeons are still dissatisfied with the performance and security of those devices. Our patent-pending ferromagnetic inductive heating technology holds the promise of producing surface-only tissue effects with energy that does not pass through the patient; uniform sealing with elimination of tissue distortion and sticking; minimizing of collateral or adjacent tissue injury or thermal damage; on-demand rapid onset and offset of effect

as various tissues or bleeding are encountered; and easy cleaning and disposability. These attributes position our technology as an ideal energy modality for surgical procedures requiring the sealing of blood vessels of a wide range of sizes.

Epitel

CEO/Principal: Mark Lehmkuhle

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT/LS

A small, user friendly, wireless device for human EEG monitoring is currently lacking. We propose an individual-use patch-type telemetry device for simplified EEG recording from human patients. This device will enable user-friendly application of the EEG electrode and real-time recording of the EEG signal either in the ICU, in an out-of-hospital setting (e.g., the home or work environment), or for research (e.g., antiepileptic drug testing). The device will consist of a small EEG electrode/transmitter unit that both wirelessly transmits EEG signals to a receiver and “logs” EEG data for later retrieval. The only component placed on the patient will be a small unit that is roughly the size of a Band-Aid™ and will have the look and feel of a “patch.” Our primary objective is to create a user-friendly, unobtrusive device that can be used to reliably record acute and/or chronic electrographic seizures under conditions where traditional ambulatory EEG is not feasible or practical.

H2O TECH

CEO/Principal: Timothy Nelson

Univ.: BYU

Affiliate/Licensee/Univ.: Licensee

Cluster: LS/MMEE

The Neptune Water Drill provides a scientifically engineered jet stream of water that is less than the thickness of a piece of paper, mixed with tiny particles of abrasive that removes dental caries. It is the most precise cutting device in the dental industry (the Neptune water drill stream diameter is 1/7 the thickness of the most used dental drill bits), which improves the art of dentistry and increases patient satisfaction.

It is a patented invention of Dr. Robert Todd, Professor of Mechanical Engineering at Brigham Young University and Scott C. Hansen. Major benefits include: (1) precision-cutting dentistry, (2) no heat from friction, (3) natural matte finish eliminates phosphoric acid etchings in the drilled out cavity, (4) no drilling sound or vibrations, (5) less irritation of the nerves, (6) reduced need for anesthesia, (7) less post operative pain, discomfort and chance for infection, (8) and lower risk of reoccurring dental caries.

Holorad

CEO/Principal: Stephen J Hart

Univ.: UVU

Affiliate/Licensee/Univ.: Affiliate

Cluster: IT

Holorad's technology prints animated interactive color holograms from Computer Graphics scenes designed in animation programs such as Autodesk Maya. This provides glasses-free 3D holograms for entertainment, advertising, and medical applications. These are holographic prints,

projecting out in front of the observer with true depth. No other technology provides this rich combination of visual stimuli, and the resulting holograms are very compelling. Hologram production and replay requires custom optical systems, and for cost-effective commercial applications these need to use highly-divergent beams which inherently produce highly distorted holograms. To correct this, Holorad pre-distorts the printed data so that the distortions cancel, producing an undistorted result. The general mathematical basis for this is known in the geometrical optics literature, but has not been extended to the required 3D formulation and implementation, so Holorad currently uses a slow iterative fine-tuning.

Knudra Transgenics

CEO/Principal: Chris Hopkins

Univ.: SLCC

Affiliate/Licensee/Univ.: Licensee

Cluster: LS

Knudra makes biosensors detecting toxicities in our environment, food, and medicines. The nematode worm's capacity to detect toxins is harnessed by genetic engineering the worm to turn green upon exposure to toxin. The observation of turning green is a biosensor of toxicity. We make many types of worm biosensors to detect different types of toxins. We arrange the worm biosensors into arrays where every array well contains a different type of biosensor. Different toxins create different patterns of biosensor activation. A digital readout of toxicity is achieved. This simplifies data interpretation. Data sets are inherently normalized allowing the most important toxic mechanism to be easily identified. Our competition has a wide variety of methods with very little standardization between tests, which leads to confusion in data interpretation. Our method is faster, cheaper, and more reliable than current methods and it uniquely reveals which toxicity mechanism is of highest concern.

Linear Signal

CEO/Principal: Greg Mockett

Univ.: BYU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT

Traditional satellite dish antenna technology suffers from quality of service problems due to poor mount installation, wind loading, rain, roof sag, and satellite orbital wobble. Smart electronically steered phased array feed antennas adjust the antenna beam adaptively to maintain maximum signal quality. Linear Signal has developed a critical enabling part for smart antennas, an integrated beamformer chip, which will be combined with high efficiency, low noise phased array antenna technology developed for radio astronomy by Prof. Warnick at BYU to produce smart antenna feeds for commercial satellite antennas on buildings, aircraft, vehicles, and ships.

Motion Sensor Suit

CEO/Principal: Carlos Mastrangelo

Univ.: UU

Affiliate/Licensee/Univ.: UU

Cluster: IT

We are developing a wireless sensor "suit" that measures the exact movement of the body. This is a superior method to the industry standard motion capture cameras and can be used in 3D

animation, life sciences, and sports science. Our sensor system is will be the first of its kind and will overcome the major drawbacks of cameras which require a direct line-of-site and a studio. It is based on state-of-the art MEMS inertial sensors and a local wireless network.

Natural Asphalt Solutions

CEO/Principal: Kimball Young

Univ.: UU

Affiliate/Licensee/Univ.: Affiliate

Cluster: MMEE

Today's commercial/conventional asphalt products represent the tail end of the crude oil refining process. Simply, they are what's left after the best parts of the crude are dedicated to other uses. Naturally occurring Utah oil sands are crude oil before refining. Utah oil sands, based on anecdotal and scientific review, are much better performing road surfacing material in durability and resilience. This technology replaces commercial/conventional asphalt in road surfacing hot mixes with oil sands based on a UDOT specification now in the final stages of development.

Sera Prognostics

CEO/Principal: Andrew Sauter

Univ.: BYU

Affiliate/Licensee/Univ.: Licensee

Cluster: LS

Sera has licensed from BYU and UofU the development and commercial rights to newly discovered biomarkers for multiple pregnancy complications that are measurable in blood samples. Sera is currently developing a commercial test for biomarkers to predict preterm birth that were identified using this proteomic discovery technology. Sera and BYU believe this approach could be used to identify proteomic biomarkers for Endometriosis and would like to pursue a New Project to develop a commercially useful test that would be an alternative to laparoscopies.

SMEDiagnostics

CEO/Principal: Brad Bertoch

Univ.: BYU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT

HSG allows a new venture's effectiveness at commercializing products to be graphically captured by integrating with a New Venture Template™ ("NVT") analysis of 15 quantifiable attributes and a database of hundreds of successful ventures. HSG statistically analyzes large amounts of industry/performance data and a large number of variables (multi-variate analysis) and graphically represents all of the objects, data points and correlations on a single screen. The NVT determines the likelihood of venture success based on 15 specific business attributes and a comprehensive database of NAICS coded companies that have been analyzed for venture success. The output delivers a comprehensive analysis of clients' resource capacity and how they compare with success within their industry. Only large consulting firms use sophisticated analytical tools and manpower to generate the results of HSG, which brings the power of an Accenture-type analysis to SMEs at a fraction of the cost.

SpeakWorks

CEO/Principal: Ken Meyers

Univ.: BYU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT

Web-based presentation feedback management software. In general, the software allows for live web recording of an oral presentation of any kind, and captures feedback synchronized to the video. The software also provides management for the recordings and feedback, including participants, groups, sessions, and feedback providers.

Synthetic Spider Silk Fibers

CEO/Principal: Randolph V. Lewis

Univ.: USU

Affiliate/Licensee/Univ.: USU

Cluster: LS

There are over 100,000 anterior cruciate ligament and 75,000 rotator cuff repair/replacements in the US costing over \$3 billion. Hence, there is a critical need for new repair strategies that provide effective mechanical reinforcement of ligament tears and rotator cuff repair as well as to stimulate and enhance the patient's own intrinsic healing potential. Our goal is to develop spider silk protein fibers for the repair/replacement of ligaments and tendons. The specific aim is to identify the best fiber processing methods to achieve the necessary mechanical properties. The innovation is the use of different "synthetic" spider silk proteins whose properties can be tuned to the planned biomedical application both by the sequence of the protein and the fiber processing methods. The expected outcome is developing materials with superior in vitro characteristics for use as tendon and ligament repair/replacement.

TheraTarget

CEO/Principal: Darwin L. Cheney

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: LS

Theratarget plans to develop a water-soluble, biodegradable co-polymer that combats cancer. The technology will target solid-cancer tumors (through antibody technology) and release anti-cancer drugs specifically to the cancer site. The attached drug is inert and non-toxic while it circulates through the blood stream, but once the polymer attaches to the solid tumor it becomes engulfed and the anti-cancer drugs become activated thus killing the tumor. The drug carrier when degraded is small enough to be cleared by the kidneys, yet large enough in a non-degraded form to remain in circulation for a sufficient time to be concentrated at the solid tumor site.

Thermal Management Technology

CEO/Principal: J. Clair Batty

Univ.: USU

Affiliate/Licensee/Univ.: Affiliate

Cluster: MMEE

Water flow metering is being mandated in more applications including secondary water use. Needed are low-cost/durable flow and “excessive-use” meters (as alarms for breakage) that tolerate sedimentary flow. Modern flow meters are expensive, complex, easily fouled, and impractical for silt-laden secondary water. The proposed non-obtrusive flow meter (NFM) is low cost, has no moving parts, no fouling potential. Small thermal/optical sensors strategically placed within the circumference of and nearly flush with the internal walls of NFM react to flow across and around their surfaces. Convective heat transfer and optical diffusion algorithms, combined with lab calibrations yield volumetric flow. Because NFM flow is determined from brief pulses of power without attaining steady state, a smaller power source—low voltage AC/DC—is required. Compact, solar and battery-assisted options exist. External logic modules provide continuous or intermittent data uploads to Bluetooth or wireless devices

ViroPan

CEO/Principal: Tyler McCabe

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: LS

Aqua-Ring is a novel medical grade polyurethane intravaginal ring (IVR) that steadily delivers ~5 mL of natural vaginal-like fluid over 5 days to treat vaginal dryness in peri- and post-menopausal women. It is a “smart” device that is self-inserted weekly and has the ability to sense the moisture need in the vagina and release fluid on-demand to supplement the lubricating fluids of the vaginal mucosa. Since women experience very different levels of vaginal dryness, Aqua-Ring has a truly unique design and is woman-specific personalized therapy that will not under treat or over treat the vaginal dryness symptoms. There is no other product that can provide this natural and personalized remedy. This product addresses all of the negatives of current estrogen replacement therapies, with their risk of cancer and heart disease, and OTC gels, with their messiness and short duration. The regulatory strategy is to seek market clearance through the Premarket Notification 510(k) pathway in 2013.

Vutara

CEO/Principal: Stan Kanarowski

Univ.: UU

Affiliate/Licensee/Univ.: Licensee

Cluster: IT/LS

Vutara has coupled cutting-edge breakthroughs in photophysics and computation to create a new super-resolution microscope, the SR-200. The SR-200 microscope is a super-resolution fluorescence microscope that combines new hardware (microscope and peripherals) and software (operational and analytical tools). Vutara SR-200 Bi-plane Technology - For over a century the work defining light microscopy resolution limits has stood to affirm that resolutions below the diffraction would be inherently out of reach, relegating science to postulate as to the localization of small objects. Today, however, we find ourselves in the midst of an optical revolution, with the introduction of several new lens based, light microscopes capable of smashing the diffraction limit, approaching single molecule resolutions. These systems have redefined light microscopy and been termed “Super-Resolution” or “Sub-diffraction” microscopes, with recent commercial introduction to the global scientific market.